Nocturnal offshore precipitation near the coastline in the Mediterranean basin

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Nocturnal offshore precipitation near the coastline caused by the convergence of a cold air mass, lead by drainage winds, with a warmer air mass or a synoptic flow has been well studied in the tropics (e.g. Yu et al., 2004; Frye, 2001; Oshawa et al., 2001; Mapes et al., 2003). However, there are not many references in the Mediterranean basin, and all of them focused in two areas, the Iberian Peninsula (Callado et al., 2002; Mazón and Pino, 2010, 2011) and in the Israel area (Greich et al., 2004; Newman 1951).

By using Tropical Rainfall Measurement Mission (TRMM) database and in some cases radar reflectivity images in the Mediterranean basin we have detected many events in the Mediterranean basin, in different seasons. Some of these events have been simulated using the version 3 of the WRF model, to analyze and characterize this phenomenon, and the role of several physical variables, such as the sea-land thermal difference that induces the drainage wind, the depth of the cold air, the LFC and LCL associated to the precipitation cells, and other parameters as the NLFC/U (Minglietta et al., 2010) and B=U/N (Wang et al., 2000). As a main conclusion, nocturnal offshore precipitation is not a rare phenomenon in the Mediterranean basin. As in the tropical regions, convergence lines are formed with several rainfall cells appears. The main difference lays in the lower precipitation rates found in the Mediterranean basin.

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